Water System Plan

City of Dayton

September 2015
(Revised January 2016)

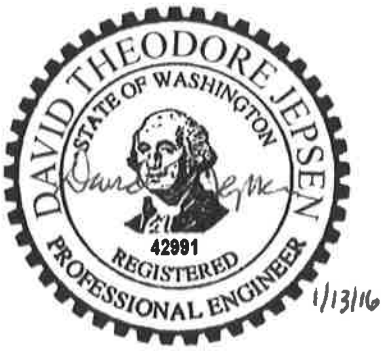
Engineering
Surveying
Natural Resources

anderson perry & associates, inc.
Walla Walla, WA La Grande, OR Prineville, OR

WATER SYSTEM PLAN

CITY OF DAYTON

SEPTEMBER 2015
(REVISED JANUARY 2016)



ANDERSON PERRY & ASSOCIATES, INC.

Walla Walla, Washington
La Grande, Oregon
Prineville, Oregon

Job No. 918-120

Chapter 3 - System Analysis

The City's water system was evaluated on the basis of criteria established by the City, the State of Washington, and the drinking water industry to determine whether the existing system facilities are capable of supplying sufficient water quantity and quality to satisfy the existing and projected water demands given in Chapter 2.

System Design Standards

A summary of the City's system design standards is given in Table 3-1.

TABLE 3-1

City of Dayton's System Design Standards

Parameter	City Standard
Water Quality Parameters	As a minimum, water quality is monitored to meet the requirements of WAC 246-290-300.
ADD and MDD	Demands calculated per Equations 5-1 and 5-2 in DOH's *Water System Design Manual* (2009) and with actual recorded system data.
PHD	WAC 246-290-221/DOH *Water System Design Manual* (2009).
Storage Requirements	WAC 246-290-235 (9)/DOH *Water System Design Manual* (2009).
Fire Flow Rate and Duration	International Fire Code (IFC, 2012).
Minimum System Pressure	WAC 246-290-230 (5 through 6) – Maintain minimum pressure of 30 psi in the system under PHD conditions and 20 psi under MDD and fire flow conditions where design volume of fire suppression (FSS) and equalizing storage (ES) are depleted.
Minimum Pipe Size	WAC 246-290-230 – Minimum 6-inch diameter for distribution and fire flow unless justified by hydraulic analysis.
Telemetry Systems	Telemetry systems are to be designed to meet the City's requirements for system operating parameters and data collection. New telemetry systems must be compatible with the City's existing system.
Backup Power Requirements	WAC 246-290-420 (5, 7, 9, and 10), DOH *Water System Design Manual* (2009) – On-site backup power equipment or gravity standby storage (SB) shall be provided unless the power grid meets the minimum reliability criteria. On-site backup power facilities shall be provided for closed system booster pump stations.
Valve and Hydrant Spacing	Valves – Chapter 8, DOH *Water System Design Manual* (2009) – Sufficient valving should be placed to keep a minimum of customers out of service when water is turned off for maintenance, repair, replacement, or additions. Hydrants – WAC 246-290-230, 650 – Hydrants shall be installed on not less than 6-inch diameter mains, located along roadside intersections where possible. The number and distribution of fire hydrants shall conform to Appendix C of the IFC.
Other System Policies	New pressure zones shall be created above an MSL elevation of 1,675 feet and below an MSL elevation of 1,560 feet. Above an MSL elevation of 1,675 feet, a City-owned booster pump station and isolation valves are required. Below 1,605 feet MSL elevation, the City recommends the user install and maintain a PRV on the house-side of the meter. Water main piping shall be looped where feasible.

Scenarios No. 2 and 3 – Peak System Flows

The second scenario evaluated the system's response under the PHD condition. Demands for major water users were placed in appropriate locations, and the remaining demand was distributed evenly throughout the system. Under this condition, the model was run with the ES in the reservoirs depleted. In accordance with the WAC 246-290-230 (5), the pressure throughout the distribution system must be at least 30 psi under PHD.

The final scenario evaluated the system's response under fire flow conditions at each hydrant during MDD conditions. For the fire flow condition, DOH requires the FSS in the reservoirs to be depleted. A maximum demand of 6,000 gpm was placed at each hydrant, one at a time, and the system response was determined. If any location in the pressure zone was below 20 psi, the demand was reduced and the simulation repeated. This procedure continued until all of the locations were supplied with a minimum of 20 psi. The hydrant either passed or failed the flow test based on the calculated fire flow requirement for that particular hydrant. In general, the minimum fire flow required was 1,000 gpm. Three areas were selected for increased fire flow demand. In the 2001 *Water System Plan* (Gray & Osborne Inc.), the fire flow requirements were 2,500 gpm for the hospital, 3,000 gpm for the high school, and 3,000 gpm for the fairgrounds. The same requirements were used in this simulation.

The results of Scenarios No. 2 and 3 were used to identify three pressure zones (see Figure 3-1): Low pressure (less than 20 psi), acceptable pressure (20 through 80 psi), and high pressure (greater than 80 psi). Of these zones, the low pressure zone is of most concern due to potential backflow conditions.

Five areas were identified as experiencing lower than the required minimum pressures for one or more of the demand conditions. Four of the five low pressure areas are a result of the relative difference in elevations between the City's water reservoirs and the service area locations. In general, the simulations indicated that areas above 1,675 feet in elevation would require a booster pump or gravity reservoir system to maintain pressure during fire flow conditions. The five areas are discussed in detail below.

Hydraulic Distribution System Deficiencies and Improvements

The following is a brief summary of the low pressure zones identified from the hydraulic modeling and proposed improvements.

Area 1: Upper Syndicate Hill – This low pressure area is near the 2.0-MG reservoir and includes the area north of South 8th Street, between 7th and 8th Streets, east of Clay Street, and between 6th and 7th Streets from the intersection of 6th and Spring Streets to East Park Street. Due to the elevation difference between this area and the 2.0-MG reservoir (approximately 20 to 70 feet from the reservoir base), the anticipated low and high static pressures are approximately 10.6 psi (the bottom of the reservoir tank and the highest residence, 1,725 feet) and 50 psi (overflow level and elevation 1,675 feet). This area was predicted to experience low pressures under all of the simulated system demand conditions. Under sustained fire flow conditions, the entire area is anticipated to experience pressures below 20 psi. The total number of affected water services in this area is approximately 40 to 50.

Short-term solutions for low pressures during high flow conditions in the Upper Syndicate Hill area include: 1) imposing a moratorium on water connections in the affected area or 2) installing individual booster pumps at each connection. Moratoriums do not solve the low pressure situation, but do prevent further pressure reductions created by additional system users. However, moratoriums are typically unpopular since the restrictions affect whether individual property owners can develop their properties. For the Upper Syndicate Hill area, the vast majority of the taxable lots are already developed. Since the area is near full development, imposing a moratorium would not likely be an effective means of correcting low pressures.

Several water users in the Upper Syndicate Hill area (especially near the 2.0-MG reservoir) already have individual booster pumps to maintain satisfactory pressures at their residences. The installation of these individual booster pumps likely dates back to either when the original residences were constructed or with the construction of the 2.0-MG reservoir in 1978. In either case, installing individual booster pumps has been the historical measure for correcting low water pressures in this area. The use of individual booster pumps appears to be the best short-term solution. Since the area is almost fully developed, the connection of additional users is not anticipated to adversely affect water service. To comply with WAC 246-290-230 (8), the City will need to manage and control any new and replaced individual booster pumps where the water system does not meet the pressure requirements of WAC 246-290-230.

Potential long-term solutions include constructing an upper level reservoir with a booster pump station to feed the reservoir or constructing a regional booster pump station. Since a new upper level reservoir would need to be located a considerable distance from Upper Syndicate Hill to achieve the necessary elevation and corresponding static water pressure for adequate water service, constructing a new reservoir is not considered a cost-effective option. Additionally, a new upper level reservoir would require constructing a new booster pump station and water main to convey water to and from the reservoir, property acquisition for the reservoir site, and easements for the new water main.

The best long-term solution for the Upper Syndicate Hill area is to install a new, regional booster pump station and a network (approximately 3,900 LF) of smaller diameter (4- and 6-inch) water mains at the 2.0-MG reservoir site. The existing 12- and 10-inch water mains would remain in place to continue to provide fire flows, while the new small diameter water mains would provide higher-pressure water service to the existing users.

Area 2: North Hill – This area is near the 220,000-gallon standpipe and includes the area northwest of Whitman Avenue. Due to the relative elevation differences between this area and the 200,000-gallon standpipe, the estimated low and high static pressures are approximately 8.5 psi (the bottom of the reservoir tank and the highest residence, 1,725 feet) and 50 psi (overflow elevation and elevation 1,675 feet), respectively. This area was predicted to experience low pressure under fire flow conditions.

Potential short- and long-term solutions for low pressures in the North Hill area are essentially the same as those identified for the Upper Syndicate Hill area. The North Hill area differs from the Upper Syndicate Hill area in two main ways: 1) the area has a limited number of existing water services currently affected by low pressures and 2) the area was

recently platted and is in the development process. Since imposing a moratorium would likely result in legal action against the City, installing individual booster pumps is the best short-term solution for correcting low pressures. The City will need to manage and control any new and replaced individual booster pump systems where the water system does not meet the pressure requirements of WAC 246-290-230. No new individual booster pumps may be installed unless the City is actually planning, designing, engineering, acquiring funding for, or constructing a booster pump station that will serve the individual booster pump sites.

For the same reasons indicated for the Upper Syndicate Hill area, the most viable long-term solution is installing a regional booster pump station. Though this area will experience future growth, the total number of services is anticipated to be approximately 15, which is not thought to adversely affect reservoir capacity or line pressure. Due to the steep topography and the lack of usable space at the 220,000-gallon standpipe site, the booster pump station would be located downhill of the standpipe. A combination of 2-, 4-, and/or 6-inch water mains (3,000 LF) would be installed to provide the higher pressure service (without fire flow) to this area.

Area 3: Cemetery – This area is above the South 6th and East Lee Streets intersection. Under fire flow conditions at the hospital, this area dropped below the minimum allowable pressure in the computer model. The estimated low and high static pressures at this water service is 19.5 psi (the bottom of the reservoir tank and elevation of 1,705 feet) and 38 psi (overflow elevation and elevation of 1,705 feet), respectively. The cemetery is served by an existing 4-inch diameter steel water line and backflow preventer.

As water at the cemetery is used exclusively for irrigation, proposed improvements (East Lee Street water line) include replacing the existing 4-inch steel pipe with approximately 250 LF of new 6-inch PVC water main using the existing backflow preventer and installing a combination air valve (to prevent vacuum in the pipe and release air).

Area 4: North Touchet Road (Outside City Limits) – Due to this area's elevation relative to the City's water reservoirs, this area typically experiences low water pressure (less than 30 psi). Estimated low and high static pressures are approximately 20 psi (the bottom of the reservoir tank) and 38 psi (overflow elevation) at an elevation of 1,704 feet, respectively. Under fire flow conditions, services above elevation 1,675 feet (approximately at the south end of the City limits) are anticipated to drop below the minimum allowable pressure. A total of 23 connections are serviced through the existing 12-inch diameter line, approximately 15 of which are believed to be in the low pressure zone during fire flow events.

The North Touchet Road area that experiences low pressure has a number of characteristics that are distinct from the Upper Syndicate Hill and North Hill areas including the following:

- Located outside City limits
- Some, but not considered high, growth potential
- A small number of existing users (23 total)
- Fire flow is not currently available

- Served by a dead-end, relatively long-run (approximately 7,500 LF) 12-inch diameter water main constructed out of a combination of PVC and steel (majority) pipe

Short-term solutions for low pressures include imposing a moratorium on new connections and/or installing individual booster pumps at each service. Potential long-term solutions include constructing an upper level reservoir with a booster pump station to feed the reservoir, constructing a regional booster pump station, or installing individual groundwater wells.

The biggest obstacles to both short- and long-term solutions are: 1) The relatively small number of users in the affected area, 2) the existing oversized main's size and anticipated condition (12-inch diameter, steel pipe), and 3) the existing main's long length (over 7,500 LF). The best short-term solution depends on the proposed long-term solution. The most viable long-term options are either constructing a booster pump station and installing a new, smaller diameter water main (4- to 6-inch) or installing an individual groundwater well for each service. Installing a new water main to serve the low pressure area of North Touchet Road will be challenging due to the existing main's location (underneath a paved County Road, on limited shoulders, through private property, with portions of steep topography) and length (approximately 4,600 LF of steel pipe needs to be replaced). Installing individual groundwater wells is appealing, since it eliminates the improvements needed to replace the existing steel water main and construct a booster pump station.

Since both potential long-term solutions have merit, selecting the best long-term solution will likely depend on which option is most cost-effective for the City and acceptable to the existing users. Timing of any proposed improvements will depend on the amount of water leakage and pressures observed in the existing water main.

In 2008, the City imposed a moratorium on any new water system connections outside the City's UGA and installed a master flowmeter and backflow preventer at the south end of South 4th Street for the 12-inch water main serving users off North Touchet Road. The enacted moratorium prevents new additional water demand from further reducing the available pressure on the North Touchet Road main. The master meter and backflow preventer installation allows flow measurement on this line and protects the City's main distribution system from potential backflow from this lower pressure area. Based on a comparison of the master meter and individual service meter readings, the 12-inch main has a significant leak downstream of the City's master meter. City staff isolated the leak to a section of the main that includes the Baileysburg area, but have been unable to detect the leak source primarily due to the low pressures in this portion of the main. Repairing and/or replacing this section of the water main will depend in part on the type, extent, and location of the leak(s).

The best short-term solution for the low pressure area on North Touchet Road is to keep the moratorium for new connections and continue to maintain and operate the existing water main. Additional investigation (i.e., North Touchet Road water service evaluation) is needed to determine the best long-term solution for possible water in this area.

Area 5: 2nd Street Southeast of the Public Schools – Under fire flow conditions at the public schools (the hydrant southeast of the 2nd and Oak Streets intersection), this area is anticipated to experience low pressures. The residual pressure at this hydrant is shown on

the model to reach the minimum allowable pressure at less than 2,100 gpm. Design fire flow for the high school is 3,000 gpm. The low pressure is attributed to the existing water main not being looped with the 8-inch diameter main on South 3rd Street. The other fire hydrants adjacent to the schools have capacities that meet or exceed the required desired fire flows.

Two options for improving fire flow on the 2nd Street side of the public schools include installing a new water main in 2nd and School Bus Streets, or looping the water mains on both these streets at 2nd and 3rd Streets. The City's preferred choice is to replace 950 LF of 6-inch AC pipe in South 2nd Street (East Park Street to halfway between the gym and shop) and East Oak Street (between South 1st and South 2nd Streets) with 12-inch diameter pipe. The City's preferred pipe improvement would replace ±60-year old pipe and galvanized steel pipe services that are already in need of replacement.

Other Distribution System Deficiencies and Improvements

In addition to the distribution system deficiencies identified by the computer hydraulic modeling, other system deficiencies or improvements include suspected leaking water main sections, replacing existing steel mains with newer pipeline material (i.e., PVC), and undersized water mains from general system design standards (e.g., 2-inch mains). Solutions for the majority of the deficiencies are obvious (e.g., replace old, undersized pipe with new, larger diameter pipe). Brief descriptions, analyses, and evaluations of the more complex projects are below.

Note: Of the improvements identified in the City's 2007 *Water System Plan,* only the North Cherry Street Drain Line project was completed.

North 5th Street and Patit Avenue – This project will complete improvements in this area initiated in 1982 and 2004. Previous work consisted of connecting the two services north of Patit Creek to a new water main and installing a flush hydrant. An attempt was made to abandon the line at Patit Avenue and North 5th Streets. However, in 2004, due to the depth of the existing main (approximately 12 feet) and a lack of funding, this work was never completed. The project will involve replacing the existing 2-, 4-, and 6-inch water mains in North 5th Street from Washington Avenue to Patit Avenue and in Patit Avenue from North 5th Street to Highway 12. The total length will be approximately 1,300 LF of 8-inch water main.

Front Street Drain Line – The overflow and drain line for the 220,000-gallon standpipe follows the Front Street right-of-way down the hill to Dayton Avenue and then continues on to a discharge point in Patit Creek. The pipe section from the standpipe to Dayton Avenue is 10-inch and is thought to be the old transmission line to the standpipe. The section from Dayton Avenue to Patit Creek is 8-inch, thin-walled pipe that is thought to be the original drain line. The section of pipe between Dayton Avenue and Patit Creek is within the street section, shallow, has very little slope, and is in extremely poor condition. The condition from the standpipe to Dayton Avenue is unknown, but is thought to be in better condition. These pipes were apparently used when the original ground-level open reservoirs were in place, and thus likely date back to the early 1900s. The section of pipe from Dayton Avenue to Patit Creek that needs to be replaced to provide sufficient hydraulic capacity with minimum slope is approximately 1,100 LF of 12-inch pipe.

Brooklyn Avenue, North 1st Street, and Whitman Avenue – Replace the existing 1-1/2-inch water line in Brooklyn Avenue from North 1st Street to North Front Street, the 2-inch water line in North 1st Street from Dayton Avenue to Whitman Avenue, and the existing 4-inch steel line in Whitman Avenue from North 1st Street to North Front Street. The length of new 8-inch diameter pipe will be approximately 830 LF.

Clay Street – Work involved in this project includes replacing the existing 4-inch steel line in Clay Street between South 3rd and South 4th Streets with approximately 420 LF of new 8-inch water line.

Patit Avenue – During the 2004 construction improvements, the existing line in Patit Avenue from North 2nd to North 3rd Streets was confirmed to be a 2-inch steel line in very poor condition. This 2-inch steel line also extends on Patit Avenue east of North 3rd Street. From North 2nd to North 3rd Streets, pipe will be replaced with approximately 500 LF of new 6- and 8-inch water main, and the existing 2-inch steel line to the east of North 3rd Street will be replaced with approximately 250 LF of 2- or 4-inch new pipe.

Tremont Street – This project includes replacing the existing 6-inch steel line between South 3rd and South 4th Streets with approximately 420 LF of new 8-inch water main.

Hannah Street – This project involves replacing the existing 4-inch steel pipe in Hannah Street between South 5th and South 6th Streets with new 6-inch diameter pipe. Part of this water line is 6-inch AC pipe expected to be in good condition. The actual length of the 4-inch steel pipe is unknown. The anticipated length of new 6-inch pipe is 350 LF. Most of the pipe to be replaced is in a steel hillside without a street.

South Cottonwood Street – In 2004, a new water line consisting of 12-inch HDPE and 10-inch PVC was installed between South 1st and South Cottonwood Streets on the pedestrian bridge to provide another water main crossing of the Touchet River. On the South Cottonwood Street side, the 10-inch PVC main was connected to an existing 6-inch AC water main that connects two existing 6-inch AC mains at the Cameron and South Cottonwood Streets intersection. To improve the hydraulics along these streets and to the southwest portion of the City, a new 8-inch main will be installed from the connection point with the existing 10-inch PVC main and with two 8-inch mains on South Cottonwood Street to West Spring Street and on Cameron Street south to Willow Street. The total length of these water mains would be approximately 2,000 LF. The pipe replacement in South Cottonwood Street (approximately 850 LF) would improve system hydraulics and replace pipe that has had numerous leaks in the last few years.

North Willow Street – Work on this project includes replacing the existing 2-inch steel water line in North Willow Street from Dayton Avenue to the City limits and connecting the water line to the existing 6-inch PVC pipe in West Whitman Avenue with approximately 500 LF of 8-inch water main.

Washington Avenue – This project replaces approximately three blocks of existing 6-inch steel water line with new 8-inch PVC water main on Washington Avenue between North 1st and North 4th Streets. An 8-inch diameter main was proposed to match the 8-inch diameter main on Washington Avenue between North 4th Street and Highway 12. The total length of this pipe replacement is approximately 1,500 LF.

North 1st Street – This project includes installing approximately 800 LF of new 8-inch water main on North 1st Street between Washington Avenue and Main Street. The new water line will replace the existing 6-inch diameter AC pipe along this two-block section.

South 6th Street – This project includes replacing three blocks of existing 6-inch steel water line on South 6th Street between Main and Tremont Streets. Approximately 1,150 LF of new 8-inch pipe will be installed.

East Main Street (South 5th to 7th Streets) – With this project, the existing 6-inch steel water main will be abandoned along the south side of Main Street between South 5th and 7th Streets and the existing services will be reconnected to the existing 10-inch cast iron main on the north side of Main Street.

East Main Street (South 7th Street to Patit Road) – This project replaces an existing 6-inch steel water main with an 8-inch or greater diameter main along East Main Street from South 7th Street east to and along Patit Road to the Columbia REA site. The area north of Highway 12 and along Patit Road is within the City's water service area and has the potential for future growth. A minimum 8-inch diameter pipe is recommended for this alignment; however, a larger diameter pipe may be needed depending on the water service demand required by future development. For this plan, installing a new 8-inch diameter main is assumed. The total estimated length of the new main is approximately 2,500 LF.

South 8th Street – This project will replace approximately 750 LF of existing 4-inch steel and 6-inch AC water line with a 10-inch water main between Spring and Main Streets. This 10-inch main will provide a large diameter pipe for the area served by the proposed Main Street-Patit Road Water Line Replacement project.

Harlem Road and Highway 12 – This project will replace an existing 4-inch steel water line on Harlem Road between Main Street and Wagon Road (Road No. 2457) with 2,000 LF of 8-inch water main and abandon 700 feet of existing 4-inch steel pipe from Harlem Road to North Pine Street.

Stockton Road – With this project, the existing 4-inch steel water line on Stockton Road from the WWTP to Stedman Road will be replaced with an 8-inch main. An 8-inch diameter pipe design is proposed for this replacement due to the existing system looping and high pressures in this area. The total anticipated length is 1,200 LF.

Stedman Road and Strom Road – This project will replace approximately 400 LF of existing 2-inch steel pipe with a new 8-inch water main on Stedman Road from Commercial Road to Stockton Road, replace approximately 500 LF of existing 2-inch steel pipe with a new 8-inch water main on Strom Road, and install approximately 150 LF of 8-inch pipe on Stedman Road north of Stockton Road.

East Race Street – This project will include replacing the existing 2-inch steel water main on Race Street, east of South 5th Street, with 250 LF of 6-inch PVC pipe.

West Dayton Avenue – This project includes replacing 400 LF of existing 4-inch cast iron pipe on West Dayton Avenue from North Willow Street to the west end with 6-inch pipe. The existing 4-inch pipe would be abandoned in place.

Labor Camp Road Loop – Improvements include completing the water main loop on Labor Camp Road from North Guernsey Avenue to the end of the Patit Road water main; approximately 1,300 LF of 8-inch main.

Pittman Road (West of Wagon Road (Road No. 2457)) – The project includes replacing approximately 1,100 LF of 1-1/2-inch steel pipe with a combination of 4- and 8-inch pipe and eliminating several long distance services.

Miscellaneous Fire Hydrants – From a review of Figure 3-2, there are a number of areas that need to have a fire hydrant installed to provide proper hydrant distribution. New fire hydrants are recommended on Cameron Street, Dayton Avenue, South 5th Avenue (near Race Street), and South 6th Avenue (near Lee Street).

Physical Capacity Analysis

The physical capacity analysis is based on the water system's ability to meet the MDD for the entire water system, including source, treatment, storage, transmission, and distribution system components. The physical components of a water system, when properly operated, provide the infrastructure for the water system's physical capacity to serve its customers under peak demand conditions.

The basic unit of a water system's physical capacity is the ERU (WAC 246-290-222). The number of ERUs a water system can accommodate is based on physical and legal constraints. Physical capacity calculations were based on guidance given in Chapter 6 of DOH's *Water System Design Manual* (2009). The physical capacity of the City's overall water system is summarized in Table 3-10. Detailed bases and calculations for the physical capacity analysis are provided in Table D-1 of Appendix D.

TABLE 3-10

Overall System Physical Capacity in ERUS

Component	ERUs
Present ERUs	2,660
Source, Water Rights Annual Volume	10,313
Source Capacity, Peak Day Based	4,027
ES	Unlimited
SB	3,059.7
Total Capacity Related Storage	3,015.3
Distribution System	See "System Deficiencies and Proposed Projects" for more information.

System Deficiencies and Proposed Projects

The system deficiencies noted in the above sections, proposed improvement projects to correct these deficiencies, and anticipated capital costs are summarized in this section. Analyses and discussions of potential improvements to resolve or eliminate existing and anticipated deficiencies were addressed in the above sections.

The identified water system improvements were assigned into one of three priority groups with Priority 1 being the most critical projects and Priority 3 being long-term projects. Improvements were assigned into priority groups based on considerations of the following: Identified health concerns, regulatory non-compliance, potential improvements to WUE (i.e., reducing leakage) and system operation, coordination with other infrastructure improvement schedules (i.e., repaving or chip sealing a street), improvement financing, and projected growth. Higher priority was given to improvements that address identified health concerns and regulatory non-compliance.

Brief descriptions of each priority group and the types of projects within that group are below.

- **Priority 1** projects are considered the most critical and should be undertaken as soon as funding can be made available. These projects are scheduled for completion within the next 6 years and include improvements to maintain system quality and health guidelines, bring the system into regulatory compliance (both short-term and/or long-term solution), and increase fire flow and/or WUE.
- **Priority 2** projects should be completed as funding becomes available. These projects include further system improvements to upgrade the existing system, bring the system into regulatory compliance, and increase fire flow and/or WUE.
- **Priority 3** projects should be implemented as needed to improve WUE, address new development, and upgrade the existing system's operation and function. These projects include improvements that may not be considered critical but improve system efficiency and operation.

The priority groups were established with input from City staff and Council.

The system deficiencies and proposed improvement projects are summarized by functional group in Table 3-11 and shown in Figure 3-3. The improvements are prioritized within each functional group. These and other program improvements are summarized in Chapter 8, Improvement Program.

TABLE 3-11

Summary of System Deficiencies and Proposed Projects

No.*	System Improvement	Reason
PRIORITY 1 IMPROVEMENTS		
D-1	North 5th Street (Washington Avenue to Patit Avenue) and Patit Avenue (North 5th Street to Highway 12) – Replace existing 2-, 4-, and 6-inch steel pipe with 1,300 LF of 8-inch pipe.	Replace undersized 2-, 4-, and 6-inch steel pipe and eliminate a water main crossing of Patit Creek.
D-2	High School Water Main – Replace existing 6-inch AC pipe in South 2nd Street (East Park Street to halfway between the gym and shop) and in East Oak Street (South 1st Street to South 2nd Street) with 950 LF of 12-inch pipe.	Insufficient fire flow capability at High School and replacement of undersized mains.
D-3	Front Street Drain Line – Replace approximately 1,100 LF of 12-inch main from Dayton Avenue, and to Patit Creek for discharge.	The section of pipe from Dayton Avenue to Patit Creek is in extremely poor condition.
D-4	North Touchet Road Area Water Line – Repair leak and add valves as needed.	Substantial leak identified on this water main that needs to be repaired.
D-5	North Hill Pressure System – Install a new booster pump station and 3,000 LF of 2-, 4-, and/or 6-inch water main on Columbia Avenue, Front Street, and Whitman Avenue.	Potential low system pressure in this area from low water level in the reservoir or high flows (e.g., fire flow) due to its proximity to the 220,000-gallon standpipe.
PRIORITY 2 IMPROVEMENTS		
D-6	Brooklyn Avenue (North 1st Street to North Front Street), North 1st Street (Dayton Avenue to Brooklyn Avenue), and Whitman Avenue (North 1st Street to North Front Street) – Replace the existing 1-1/2-, 2-, and 4-inch steel pipe with 830 LF of 8-inch pipe.	Replace undersized 1-1/2-, 2-, and 4-inch steel pipe.
D-7	Clay Street (South 3rd to South 4th Streets) – Replace existing 4-inch steel pipe with 420 LF of 8-inch pipe.	Replace undersized 4-inch steel pipe.
D-8	Patit Avenue (North 2nd Street to dead end east of North 3rd Street) – Replace existing 2-inch steel pipe with 500 LF of 6- and 8-inch pipe and 250 LF of 2- or 4-inch pipe east of North 3rd Street.	Replace undersized 2-inch steel pipe.
D-9	Tremont Street (South 3rd to South 4th Streets) – Replace existing 6-inch steel pipe with 420 LF of 8-inch pipe.	Replace undersized 6-inch steel pipe.
D-10	Hannah Street (South 5th to South 6th Streets) – Replace existing 4-inch steel pipe with 350 LF of 6-inch pipe.	Replace undersized 4-inch steel pipe.
D-11	Upper Syndicate Hill Pressure System – Install a new booster pump station and 3,900 LF of 4- and 6-inch water main.	Potential low system pressure in this area from low water level in the reservoir or high flows (e.g., fire flow) due to its proximity to the 2.0-MG reservoir.

***** *– D - Distribution*

TABLE 3-11 (CONT.)

Summary of System Deficiencies and Proposed Projects

No.*	System Improvement	Reason
PRIORITY 3 IMPROVEMENTS		
D-12	South Cottonwood Street (West Spring Street to 650 LF south of Cameron Street) – Replace existing 6-inch AC main with 2,000 LF of 8-inch pipe.	Replace undersized 6-inch AC water main.
D-13	North Willow Street (Dayton Avenue to the City limits and connecting to the line in West Whitman Avenue) – Replace existing 2-inch steel pipe with 500 LF of 8-inch pipe and complete a loop.	Replace undersized 2-inch steel pipe and loop system by connecting to the 6-inch main on West Whitman Avenue.
D-14	Washington Avenue (North 1st to North 4th Streets) – Replace existing 6-inch steel pipe with 1,500 LF of 8-inch pipe.	Replace undersized 6-inch steel pipe.
D-15	North 1st Street (Washington Avenue to Main Street) – Replace existing 6-inch AC pipe with 800 LF of 8-inch pipe.	Replace undersized 6-inch AC pipe.
D-16	South 6th Street (Main to Tremont Streets) – Replace existing 6-inch steel pipe with 1,150 LF of 8-inch pipe.	Replace undersized 6-inch steel pipe.
D-17	East Main Street (South 5th to South 7th Streets) – Abandon existing 6-inch steel pipe and transfer services to the existing 10-inch pipe.	Abandon old pipe and put services on newer 10-inch pipe.
D-18	East Main Street (South 7th Street to Patit Road) and Patit Road (from East Main Street to Columbia REA) – Replace existing 6-inch steel pipe with 2,500 LF of 8-inch pipe.	Replace undersized 6-inch steel pipe.
D-19	South 8th Street (Spring to Main Streets) – Replace existing 4-inch steel pipe and 6-inch AC pipe with 750 LF of 10-inch main.	Replace undersized 4-inch steel pipe and 6-inch AC pipe.
D-20	Harlem Road and Highway 12 (Wagon Road (Road No. 2457) to North Pine Street) – Replace 2,700 LF of 4-inch steel pipe with 2,000 LF of 8-inch pipe and abandon 700 LF of pipe.	Replace and abandon undersized 4-inch steel pipe.
D-21	Stockton Road (WWTP to Stedman Road) – Replace existing 4-inch steel pipe with 1,200 LF of 8-inch pipe.	Replace undersized 4-inch steel pipe.
D-22	Stedman Road (Commercial Road past Stockton Road) and Strom Road – Replace existing 2-inch steel pipe with 900 LF of 8-inch pipe and install 150 LF of 8-inch pipe north of Stockton Road.	Replace undersized 2-inch steel pipe and install new 8-inch pipe for future water service.
D-23	East Lee Street (South 6th Street to the cemetery pumphouse) – Replace existing 4-inch steel pipe with 250 LF of 6-inch pipe.	Replace undersized 4-inch steel pipe.

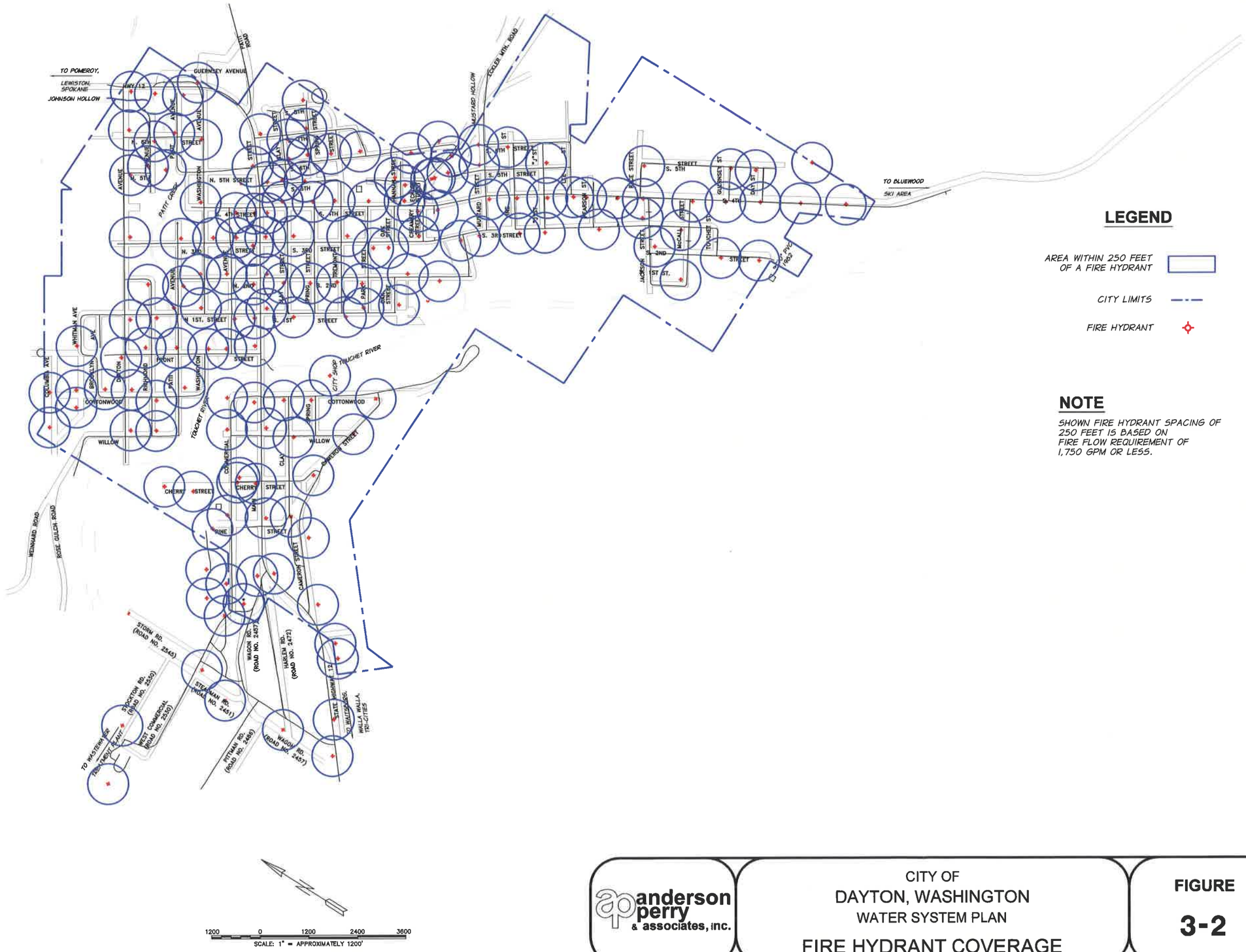
** – D - Distribution*

TABLE 3-11 (CONT.)

Summary of System Deficiencies and Proposed Projects

No.*	System Improvement	Reason
PRIORITY 3 IMPROVEMENTS (CONT.)		
D-24	East Race Street (East of South 5th Street) – Replace existing 2-inch steel pipe with 250 LF of 6-inch pipe.	Replace undersized 2-inch steel pipe.
D-25	West Dayton Avenue (North Willow Street to west end) – Replace existing 4-inch cast iron pipe with 400 LF of 6-inch pipe.	Replace undersized 4-inch cast iron.
D-26	Labor Camp Road Loop – (North Guernsey Avenue to the end of the Patit Road line) – Complete loop and install 1,300 LF of 8-inch main.	To complete water main system loop in the area.
D-27	Pittman Road (west of Wagon Road (Road No. 2457)) – Replace approximately 1,100 LF of 1-1/2-inch pipe with 4- to 8-inch pipe and eliminate several long service lines.	Replace undersized 1-1/2-inch steel pipe and eliminate several long distance service lines.
D-28	Miscellaneous Fire Hydrants – Install fire hydrants at necessary locations, including those shown on Figure 3-3.	Install fire hydrants to meet maximum spacing per IFC.

** – D – Distribution*



LEGEND

AREA WITHIN 250 FEET OF A FIRE HYDRANT

CITY LIMITS

FIRE HYDRANT

NOTE

SHOWN FIRE HYDRANT SPACING OF 250 FEET IS BASED ON FIRE FLOW REQUIREMENT OF 1,750 GPM OR LESS.

anderson perry & associates, inc.

CITY OF
DAYTON, WASHINGTON
WATER SYSTEM PLAN
FIRE HYDRANT COVERAGE

FIGURE
3-2

LEGEND

- EXISTING HYDRANT
- EXISTING VALVE
- (D1) IMPROVEMENT DESIGNATION (D-DESIGNATION, S-SOURCE) AND IMPROVEMENT NUMBER
- PRIORITY 1 IMPROVEMENTS
- PRIORITY 2 IMPROVEMENTS
- PRIORITY 3 IMPROVEMENTS

anderson perry & associates, inc.

CITY OF
DAYTON, WASHINGTON
WATER SYSTEM PLAN

PROPOSED SYSTEM IMPROVEMENTS

FIGURE
3-3

R:\Clients\Dayton\918-...ar System Update\020 Plan Update\Water System Figure 3-3.dwg, 1/13/2016 12:50:13 PM

TABLE 8-1

Capital Improvement Program

No.[1]	Description	Reference	Total Cost Estimate[2]	Anticipated Funding Source[3]	Year
PRIORITY 1 IMPROVEMENTS					
D-1	North 5th Street (Washington Avenue to Patit Avenue) and Patit Avenue (North 5th Street to Highway 12) – Replace existing 2-, 4-, and 6-inch steel pipe with 1,300 LF of 8-inch pipe.	3-17 and 3-22	$180,000	Outside/Reserve	2015-17
D-2	High School Water Main – Replace existing 6-inch AC pipe in South 2nd Street (East Park Street to halfway between the gym and shop) and in East Oak Street (South 1st Street to South 2nd Street) with 950 LF of 12-inch pipe.	3-16, 3-17, and 3-22	$150,000	Outside/Reserve	2015-17
D-3	Front Street Drain Line – 1,100 LF of 12-inch pipe.	3-17 and 3-22	$110,000[4] or $55,000[5]	Outside/Reserve	2018-20
D-4	North Touchet Road Area Water Line – Repair leak and add valves as needed.	3-15, 3-16, and 3-22	$50,000[6]	Reserve	2015-16
D-5	North Hill Pressure System – Install a new booster pump station and 3,000 LF of 2-, 4-, and/or 6-inch water main on Columbia Avenue, Front Street, and Whitman Avenue.	3-14, 3-15, and 3-22	$285,000	Outside/Reserve	2018-20
	Total Priority 1 Project Costs		**$720,000 or 775,000**	-	-
PRIORITY 2 IMPROVEMENTS					
D-6	Brooklyn Avenue (North 1st Street to North Front Street), North 1st Street (Dayton Avenue to Brooklyn Avenue), and Whitman Avenue (North 1st Street to North Front Street) – Replace existing 1-1/2-, 2-, and 4-inch steel pipe with 830 LF of 8-inch pipe.	3-18 and 3-22	$130,000	Outside/Reserve	2021-27
D-7	Clay Street (South 3rd to South 4th Streets) – Replace existing 4-inch steel pipe with 420 LF of 8-inch pipe.	3-18 and 3-22	$60,000	Outside/Reserve	2021-27
D-8	Patit Avenue (North 2nd Street to dead end east of North 3rd Street) – Replace existing 2-inch steel pipe with 500 LF of 6- and 8-inch pipe and 250 LF of 2- or 4-inch pipe east of North 3rd Street.	3-18 and 3-22	$105,000	Outside/Reserve	2021-27

[1] – D – Distribution

[2] – Total project cost estimates based on December 2014.

[3] – Outside – Improvements financed with one of the water infrastructure funding assistance programs outlined in Chapter 9.
Reserve – Improvements financed through the City's cumulative water resource fund.

[4] – Based on a standalone project.

[5] – Based on being replaced as part of a street.

[6] – The cost shown is a placeholder. The actual cost cannot be determined until the sources of the leaks are identified.

TABLE 8-1 (CONT.)

Capital Improvement Program

No.[1]	Description	Reference	Total Cost Estimate[2]	Anticipated Funding Source[3]	Year
PRIORITY 2 IMPROVEMENTS (CONT.)					
D-9	Tremont Street (South 3rd to South 4th Streets) – Replace existing 6-inch steel pipe with 420 LF of 8-inch pipe.	3-18 and 3-22	$60,000	Outside/Reserve	2021-27
D-10	Hannah Street (South 5th to South 6th Streets) – Replace existing 4-inch steel pipe with 360 LF of 6-inch pipe.	3-18 and 3-22	$60,000	Outside/Reserve	2021-27
D-11	Upper Syndicate Hill Pressure System – Install a new booster pump station and 3,900 LF of 4- and 6-inch water main.	3-13, 3-14, and 3-22	$585,000	Outside/Reserve	2021-27
	Total Priority 2 Project Costs		**$1,000,000**	-	-
PRIORITY 3 IMPROVEMENTS					
D-12	South Cottonwood Street (West Spring Street to 650 LF south of Cameron Street) – Replace existing 6-inch AC main with 2,000 LF of 8-inch pipe.	3-18 and 3-23	$290,000	Outside/Reserve	2028-34
D-13	North Willow Street (Dayton Avenue to the City limits and connecting to the line in West Whitman Avenue) – Replace existing 2-inch steel pipe with 500 LF of 8-inch pipe and complete a loop.	3-18 and 3-23	$70,000	Outside/Reserve	2028-34
D-14	Washington Avenue (North 1st to North 4th Streets) – Replace existing 6-inch steel pipe with 1,500 LF of 8-inch pipe.	3-18 and 3-23	$225,000	Outside/Reserve	2028-34
D-15	North 1st Street (Washington Avenue to Main Street) – Replace existing 6-inch AC pipe with 800 LF of 8-inch pipe.	3-19 and 3-23	$120,000	Outside/Reserve	2028-34
D-16	South 6th Street (Main to Tremont Streets) – Replace existing 6-inch steel pipe with 1,150 LF of 8-inch pipe.	3-19 and 3-23	$170,000	Outside/Reserve	2028-34
D-17	East Main Street (South 5th to South 7th Streets) – Abandon existing 6-inch steel pipe and transfer services to the existing 10-inch pipe.	3-19 and 3-23	$65,000	Outside/Reserve	2028-34
D-18	East Main Street (South 7th Street to Patit Road) and Patit Road (from East MainStreet to Columbia REA) – Replace existing 6-inch steel pipe with 2,500 LF of 8-inch pipe.	3-19 and 3-23	$350,000	Outside/Reserve	2028-34

[1] – D – Distribution

[2] – Total project cost estimates based on December 2014.

[3] – Outside – Improvements financed with one of the water infrastructure funding assistance programs outlined in Chapter 9.
Reserve – Improvements financed through the City's cumulative water resource fund.

[4] – Based on a standalone project.

[5] – Based on being replaced as part of a street.

[6] – The cost shown is a placeholder. The actual cost cannot be determined until the sources of the leaks are identified.

TABLE 8-1 (CONT.)

Capital Improvement Program

No.[1]	Description	Reference	Total Cost Estimate[2]	Anticipated Funding Source[3]	Year
PRIORITY 3 IMPROVEMENTS (CONT.)					
D-19	South 8th Street (Spring to Main Streets) – Replace existing 4-inch steel pipe and 6-inch AC pipe with 750 LF of 10-inch main.	3-19 and 3-23	$110,000	Outside/Reserve	2028-34
D-20	Harlem Road and Highway 12 (Wagon Road (Road No. 2457) to North Pine Street) – Replace 2,700 LF of 4-inch steel pipe with 2,000 LF of 8-inch pipe and abandon 700 LF of pipe.	3-19 and 3-23	$320,000	Outside/Reserve	2028-34
D-21	Stockton Road (WWTP to Stedman Road) – Replace existing 4-inch steel pipe with 1,200 LF of 8-inch pipe.	3-19 and 3-23	$170,000	Outside/Reserve	2028-34
D-22	Stedman Road (Commercial Road past Stockton Road) and Strom Road – Replace existing 2-inch steel pipe with 900 LF of 8-inch pipe and install 150 LF of new 8-inch pipe north of Stockton Road.	3-19 and 3-23	$145,000	Outside/Reserve	2028-34
D-23	East Lee Street (South 6th Street to the cemetery pump house) – Replace existing 4-inch steel pipe with 250 LF of 6-inch pipe.	3-15 and 3-23	$35,000	Outside/Reserve	2028-34
D-24	East Race Street (east of South 5th Street) – Replace existing 2-inch steel pipe with 250 LF of 6-inch pipe.	3-19 and 3-24	$35,000	Outside/Reserve	2028-34
D-25	West Dayton Avenue (North Willow Street to west end) – Replace existing 4-inch cast iron pipe with 400 LF of 6-inch pipe.	3-19 and 3-24	$56,000	Outside/Reserve	2028-34
D-26	Labor Camp Road Loop (North Guernsey Avenue to the end of the Patit Road line) – Complete loop and install 1,300 LF of 8-inch main.	3-20 and 3-24	$180,000	Outside/Reserve	2028-34
D-27	Pittman Road (west of Wagon Road (Road No. 2457)) – Replace approximately 1,100 LF of 1-1/2-inch steel pipe with 4- to 8-inch pipe and eliminate several long services lines.	3-20 and 3-24	$180,000	Outside/Reserve	2028-34
D-28	Miscellaneous Fire Hydrants – Install fire hydrants at necessary locations, including those shown on Figure 3-3.	3-20 and 3-24	$50,000	Outside/Reserve	2028-34
	Total Priority 3 Project Costs		**$2,571,000**	-	-

(1) – D – Distribution

(2) – Total project cost estimates based on December 2014.

(3) – Outside – Improvements financed with one of the water infrastructure funding assistance programs outlined in Chapter 9.
Reserve – Improvements financed through the City's cumulative water resource fund.

(4) – Based on a standalone project.

(5) – Based on being replaced as part of a street.

(6) – The cost shown is a placeholder. The actual cost cannot be determined until the sources of the leaks are identified.

- Determine the availability of outside funding sources and identify the local cost share.
- Determine the cost to system users to finance the local share and the annual cost of O&M.

With any of the proposed funding sources, the City is advised to confirm specific funding amounts with the appropriate agencies prior to making local financing arrangements.

Several different strategies can be used to finance capital improvements. Selecting the best strategy depends on factors including the anticipated monthly user charge, the amount and length of time for debt service, the improvement schedule, and the amount of transfers to the existing capital reserve fund. We recommend the following steps to address Dayton's water system infrastructure needs.

- Initiate a water rate setting strategy where rates and fees are reviewed annually, increased to reflect inflation and new system costs, and sufficient to maintain adequate reserve funding.
- Modestly increase water system rates to increase capital improvement funding and have adequate resources available when replacement is necessary.
- Aggressively pursue all Federal, State, and other external funding (especially grants) for both preconstruction and construction of capital improvements.

Proposed Financing Plan

Ideally, the following Priority 1 Improvement projects will be completed in the next 6 years:

- North 5th Street and Patit Avenue (D-1)
- High School Water Main (D-2)
- Front Street Drain Line (D-3)
- North Touchet Road Area Water Line (D-4)
- North Hill Pressure System (D-5)

The North Touchet Road Area Water Line improvements are currently being investigated and will be financed using the City's Water System Improvement Reserve Fund (No. 404). For the North Hill Pressure System project, the City should apply for a 2016 DOH Small Systems Preconstruction Grant (maximum $25,000) and use the grant money to complete an Engineering Report on the proposed improvements. Depending on the timing and outcome of the Engineering Report, and the City's User Rate Study, the City could apply for a 2017 Drinking Water SRF Construction Loan and a 2017 DOH Preconstruction Grant for the North Hill Pressure System project and the other Priority 1 Improvements. Based on the timing and type of project funding obtained, construction of the Priority 1 Improvements could occur in 2018 or 2019. If Drinking Water SRF construction loan monies are unavailable, construction of the proposed improvements will be delayed until additional revenue is generated or another source of acceptable project financing is secured.

With any of the proposed funding alternatives, additional revenue will be needed to repay the accumulated debt. The impact on water rates is addressed below under Rate Assessment.

Financial Viability Test (FVT)

The purpose of the FVT is to ensure that the water system meets all regulatory and prudent business practices. The FVT demonstrates that the total cost of providing service to the water system has been

taken into consideration. Four related tests were performed to assess the FVT of the City's financial plan for its water system: 1) 6-year operation period, 2) operating cash reserve, 3) emergency reserve, and 4) household income index.

Utility System Financial Capacity worksheets (Version 1.1) developed by the Environmental Finance Center at Boise State University were used to determine the financial viability of the City's water system and a financial strategy for constructing the proposed improvements. The worksheets allow for input of initial cost values and inflation rates to determine future expenses and rates required for future budgets. The information generated from these worksheets can be used to determine if a public water system will have the financial capabilities necessary for the sustained water service for its customers. The worksheets also assist public water systems in determining whether key criteria of financial viability are being met, or will be met, based on current and future operations, by investments in the system, and by the establishment of certain reserves.

One major consideration when constructing any proposed capital improvements is the users' ability to support the full cost, including debt repayment, of utility service. Several measures of household affordability or ability-to-pay have been proposed or are currently being utilized. One of the most common affordability indicators used in the financing community is the ratio of annual user charges to MHI. The threshold of affordability for this ratio varies from 1.5 to 2.5 percent of MHI. For this report, a value of 2.0 percent of the MHI was utilized to assess affordability of the proposed rates.

The City's financial plan is based on the following:

- The City's 2015 budget and 2014 actual revenue and expenditures.
- The initial number of billing units is assumed to be 1,922 ERUs. Growth of an additional 14 ERUs was assumed to occur within the plan's 6-year period (2014 to 2020).
- Based on the anticipated revenue for 2015, divided by 1,922 ERUs, the City's average monthly water rate is $32.50 per ERU.
- The City's MHI is $38,405.
- Three percent inflation per year for operating expenses and MHI.
- The operating reserve was budgeted to meet 1/8 of annual O&M expenses, plus general and administrative expenses within the 6-year budget schedule.
- The water fund's emergency reserve budget is $100,000.
- Leak detection and repair of the North Touchet Road Water Line (D-4) will be an expenditure of approximately $50,000 in 2015.
- A total expenditure of $55,200 is projected in 2016 and 2017 for preconstruction and other related work with respect to Priority 1 Improvements.
- Construction of proposed Priority 1 Improvements and loan payments will begin in 2018. The projected expenditure for these construction improvements is $424,000 (2017 dollars).

The City's projected finances are shown on the compiled Utility System Financial Capacity Worksheets included in Appendix H, and summary of the FVTs is shown on page 3 of the worksheets. With this suggested plan, the City could satisfy all the FVTs and maintain the debt services coverage ratio of greater than 1.0 percent.

Rate Assessment

Future City water rates will increase due to inflation, additional debt service payments for the 2010 Revenue Bond, and new anticipated debt service for the Priority 1 Improvements.

- With inflation at 3 percent per year, an additional $109,000 will be needed per year to fund the water system O&M in 2020.
- Starting in 2019, the 2010 Revenue Bond water system debt service payments will increase from approximately $88,000 per year to $148,700 per year, an annual increase of $60,700.
- Anticipated annual debt service for a Drinking Water SRF loan of $424,000 (2017 dollars) is approximately $24,940 per year.

Based on these three factors, the total annual water rates will need to increase by $194,600 per year, or $8.38 per ERU per month. With the City's projected average monthly water rate of $32.50 per ERU in 2015, the total anticipated monthly water rate per ERU in 2020 is anticipated to be approximately $42.00 per month.

The anticipated average monthly user rates per ERU between 2015 and 2020 are summarized in Table 9-10. These projected rates are based on increases ranging from $1.50 to $2.00 per month per ERU. The suggested schedule for average monthly user rates includes rate increases ranging from 4.6 to 5.9 percent between 2015 and 2020.

TABLE 9-10

Anticipated Average Monthly User Rates per ERU

Parameter/Year	2015	2016	2017	2018	2019	2020
Overall Charge, $/month	$32.50	$34.00	$36.00	$38.00	$40.00	$42.00
Percent Increase	-	4.6	5.9	5.6	5.3	5.0

The ability to pay indicator is expressed as a percentage of the MHI and referred to as "affordability criteria." EPA's stated view is that potable water utility fees are affordable if costs are less than 2.5 percent of a community's MHI (U.S. Conference of Mayors, AWWA, and Water Environment Federation, 2013). Using EPA's affordability criteria and the MHI for all households, average monthly water system rates of $89.33 in Dayton would be considered affordable by EPA. The projected average water rate of $32.50 per month is approximately 1.0 percent of the current MHI and is thus considered "affordable" by regulatory and funding agencies. Assuming the MHI within the City increases 3 percent per year, the projected 2020 MHI is $44,522. The anticipated average monthly rate per ERU of $42.00 in 2020 is projected to increase slightly to 1.1 percent of the projected MHI for City of Dayton. Since $42.00 per month per ERU is less than 2.5 percent of the community's MHI, this rate is still considered "affordable."

While the current and projected City water rates are considered "affordable," future water rate increases will adversely affect households with incomes significantly less than the MHI (i.e., renter-occupied, young, and elderly households). When considering future rate increases, the City should evaluate different means to minimize the rate increase to low income users, such as adjusting the cost and volume allowance of the base and usage rates, providing discounts for low income users, and implementing a voluntary utility assistance program. Further consideration of different options to

minimize the effect of water rate increases on low income users would best be evaluated in a water system rate study.

Project Implementation

A schedule identifying the key tasks and approximate implementation dates of the recommended projects is provided in Table 9-11.

TABLE 9-11

Project Implementation Summary

Key Task or Activity	Implementation Date
Submit Water System Plan to DOH for Review and Comment	April 2015
DOH Review and Comment Period	May – December 2015
Respond to DOH Comments on Water System Plan	January 2016
Apply for DOH Preconstruction Grant for North Hill Pressure System Improvements (D-5)	January 2016
DOH Approval of Water System Plan	February 2016
Leak Detection and Repair of North Touchet Road Water Line (D-4)	January – December 2016
Water User Rate Study	May – October 2016
Apply for DOH Small Systems Preconstruction Grant for North Hill Pressure System Improvements and other Priority 1 Improvements	January 2017
Apply for SRF Construction Loan for Priority 1 Improvements	September 2017
Preconstruction Work for Priority 1 Improvements	April – September 2017
Construction of Priority 1 Improvements	June – November 2018